

REMARKS

This request for reconsideration is filed in response to the final Office Action dated February 16, 2011. For the following reasons this application should be allowed and the case passed to issue.

Claims 1, 3-6, and 8-15 are pending in this application. Claims 8-15 were withdrawn pursuant to a restriction requirement. Claims 1 and 3-6 were rejected. Claims 2 and 7 were previously canceled.

Claim Rejections Under 35 U.S.C. § 103

Claims 1 and 3-5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Delzeit (US 6,858,197). The Examiner found that Delzeit teaches a catalyst structure having a multilayer catalyst material with an even surface and a first layer of non-catalytic aluminum, a second layer of catalytic iron, cobalt, or nickel covered by a third layer of catalytic molybdenum. The Examiner found that the catalyst structure can be formed into arrays of a variety of aperture patterns, shapes, and letters, and numbers, such as the number 8, which is a two pipe structure or zero, which would be a single pipe structure. The Examiner noted that Reference Nos. 42 or 45 of Fig. 4 are parts of the layered catalytic structure having substantially no catalytic activity.

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Delzeit in view of Fan et al. (Science vol. 283, pages 512-514, (1999)). The Examiner acknowledged that Delzeit does not teach oxidizing the crystal growth surface. The Examiner relied on the teaching of Fan et al. of oxidizing the surface of iron as a catalyst material to assert it would have been obvious to substitute an iron catalyst of Delzeit with an iron oxide catalyst to produce predictable results.

Delzeit and Fan et al., whether taken in combination, or taken alone, do not suggest the claimed assembly of a plurality of catalyst structures because Delzeit and Fan et al. do not suggest the catalyst structure is shaped as a pipe with its even upper surface serving as a crystal growth surface, the catalyst structure including a catalytic material that forms a ring corresponding to a carbon nanotube on the crystal growth surface, and at least part of a side of the structure shaped as a pipe has a non-catalytic material with substantially no catalytic activity with respect to a growth of the crystalline carbon, as required by claim 1.

In the present invention, the catalytic material forms a ring in the crystal growth surface 22 where the whole of the catalyst structure is shaped as a pipe, as shown in Fig. 2C. Delzeit, on the other hand, discloses that the structure of the catalyst can be formed as the number 8, which is a two-ring shape where the whole of the structure is a layered structure, as shown in Figs. 1, 4, and 5. Delzeit fail to teach or suggest that the catalyst structure is shaped as a pipe, as required by claim 1 because Delzeit does not disclose that at least a part of a side of the structure shaped as a pipe has a non-catalytic material, as required by claim 1. The portion of the structure relied on by the Examiner as having non-catalytic activity (Ref. Nos. 42 and 45 in Fig. 4) is not shaped as a pipe. Rather, layers 42 and 45 appear to be rectangular shape. Further, there is no suggestion that there is an opening formed in layers 42 and 45 which would correspond to the interior walls of a pipe. The Examiner has no basis for asserting that Delzeit teaches or suggest at least a part of a side of the structure shaped as a pipe has a non-catalytic material with substantially no catalytic activity with respect to a growth of the crystalline carbon, as required by claim 1. Even if the ring-shaped catalytic layer features disclosed by Delzeit were considered to be pipe-shaped, and Applicants do not agree they are pipe-shaped, it is only the catalytic layer

that is "pipe-shaped," not the non-catalytic material layers. Fan et al. do not cure the deficiencies of Delzeit.

The dependent claims are allowable for at least the same reasons as claim 1 and further distinguish the claimed assembly of a plurality of catalyst structures.

In view of the above remarks, Applicant submits that this application should be allowed and the case passed to issue. If there are any questions regarding this Response or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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